REMARKS

For the purpose of application clarity and limiting the invention in the application, applicant has chosen to cancel the outstanding set of claims 1-96 and submit new claims 97- 132. In accordance with the Examiner' request the following is a list of claims and the figures to which each is directed:

Claim 97	Figure 2
Claim 98	Figure 2
Claim 99	Figure 2
Claim 100	Figure 2
Claim 101	Figure 2
Claim 102	Figure 2
Claim 103	Figure 2
Claim 104	Figure 2
Claim 105	Figure 2 + (Figure 5 or 6)
Claim 106	Figure 2 + (Figure 5 or 6)
Claim 107	Figure 2 + (Figure 5 or 6)
Claim 108	Figure 2 + (Figure 5 or 6)
Claim 109	Figure 2 + (Figure 5 or 6)
Claim 110	Figure 2 + Figure 4B
Claim 111	Figure 2 + Figure 4B
Claim 112	Figure 2 + Figure 4B
Claim 113	Figure 2 + Figure 4A
Claim 114	Figure 2 + (Figure 5 or 6)
Claim 115	Figure 2 + (Figure 5 or 6)
Claim 116	Figure 2 + (Figure 5 or 6)
Claim 117	Figure 2 + Figure 7A

Claim 118	Figure 2
Claim 119	Figure 2
Claim 120	Figure 9
Claim 121	Figure 9
Claim 122	Figure 9
Claim 123	Figure 9
Claim 124	Figure 2 + Figure 15A-D
Claim 125	Figure 2 + Figure 21
Claim 126	Figure 2 + Figure 15A-D
Claim 127	Figure 2 + Figure 15A-D
Claim 128	Figure 2 + Figure 15A-D
Claim 129	Figure 2
Claim 130	Figure 2 + Figure 21
Claim 131	Figure 2 + Figure 21
Claim 132	Figure 2 + Figure 21

Independent Claims 97 and 118 claim the basic structure for the optical interconnect, typically a waveguide. Claim 97 includes the elements that comprise the optical interconnect and Claim 118 includes the layered structure of the optical interconnect. Both Claims 97 and 118 are illustrated in Figure 2. Independent Claim 120 is directed to an optoelectronic system that includes the interconnect of the present invention having grating structures in combination with an electrode plate. The system acts as a tunable laser. Independent Claim 124 is directed to three-dimensional optoelectronic devices interconnect structures. The optical interconnects of the present invention are capable of being stacked above the substrate such that the interconnects can be fabricated in multiple plane orientations.

It is not believed that extensions of time or related fees are required, beyond those, which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner For Patents, Washington, DC 20231, on November 22, 2002.

Sarah B. Simmons

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97. (New) An optoelectronic device, comprising:

a substrate having a first surface; and

at least one optical interconnect formed on the first surface of the flexible substrate comprising a sol-gel based material and an active region;

98. (New) The optoelectronic device of Claim 97, wherein the active region comprises rare earth ions.

99. (New) The optoelectronic device of Claim 98, wherein the rare earth ions have transition lines in the about 0.2 micron to about 3.0 micron spectrum when illuminated by said at least one optical source.

100. (New) The optoelectronic device of Claim 98, wherein the rare earth ions have transition lines in the about 1.5 micron region when illuminated by said at least one optical source.

101. (New) The optoelectronic device of Claim 98, wherein the rare earth ions comprise a rare earth ion chosen from the group consisting of erbium, ytterbium and neodymium ions.

102. (New) The optoelectronic device of Claim 98, wherein the rare earth ions further comprise erbium ions and ytterbium ions.

103. (New) The optoelectronic device of Claim 97, wherein the sol-gel based material further comprises at least one electro-optic organic component.

104. (New) The optoelectronic device of Claim 97, wherein the active region is capable of being optically side-pumped.

105. (New) The optoelectronic device of Claim 97, further comprising at least one optical source for optically pumping the active region.

106. (New) The optoelectronic device of Claim 105, wherein the at least one optical source is chosen from the group consisting of at least one vertical cavity surface emitting laser (VCSEL), at least one fiber laser, at least one waveguide laser and at least one semiconductor laser.

107. (New) The optoelectronic device of Claim 105, wherein the at least one optical source is used to side-pump the active region of the optical interconnect.

108. (New) The optoelectronic device of Claim 105, further comprising an optical detector that is in optical communication with the optical interconnect for detecting an optical signal within the optical interconnect.

109. (New) The optoelectronic device of Claim 108, wherein the optical detector comprises a sol-gel based material.

110. (New) The optoelectronic device of Claim 97, wherein the at least one optical interconnect further comprises grating structures formed on the at least one optical interconnect.

111. (New) The optoelectronic device of Claim 110, wherein the grating structures have a fixed periodicity.

112. (New) The optoelectronic device of Claim 110, wherein the grating structures have a chirped periodicity.

113. (New) The optoelectronic device of Claim 97, wherein the at least one optical interconnect further comprises prism structures formed on the at least one optical interconnect.

114. (New) The optoelectronic device of Claim 97, wherein the at least one optical interconnect further comprises a plurality of optical interconnects disposed in a predetermined pattern on the first surface of the substrate.

115. (New) The optoelectronic device of Claim 114, wherein the plurality of optoelectronic interconnects are point-to-point waveguides.

116. (New) The optoelectronic device of Claim 114, wherein the plurality of optoelectronic interconnects are point-to-multipoint waveguides.

117. (New) The optoelectronic device of Claim 114, wherein the plurality of optoelectronic interconnects are point-to-point waveguides and point-to-multipoint waveguides.

118. (New) An optoelectronic device comprising:

a substrate having a first surface;

a first cladding layer disposed on the first surface of the flexible substrate, the first cladding layer comprising a first sol-gel based material;

a core layer disposed on the first cladding layer, the core layer comprising a second sol-gel based material and having a higher refractive index than the first cladding layer; and

a second cladding layer disposed on the core layer and the first cladding layer, the second cladding layer comprising the first sol-gel based material.

119. (New) The optoelectronic device of Claim 118, wherein the first and second cladding layer is formed at process temperatures below the glass transition temperature of the first sol-gel based material and the core layer is formed at process temperatures below the glass transition temperature of the second sol-gel based material.

120. (New) An optoelectronic system comprising:

a substrate having a first surface;

at least one optical interconnect formed on the first surface of the substrate comprising a sol-gel based material and including an active region and grating structures formed on the active region; and

at least one electrode plate proximate the active region of the interconnect,

wherein applying voltage to the at least one electrode plate alters the refractive index of the active region.

121. (New) The optoelectronic system of Claim 120, wherein the active region is doped with a rare earth ion.

122. (New) The optoelectronic system of Claim 120, wherein the active region is doped with one of the rare earth ions chosen from the group consisting of erbium, ytterbium, and neodymium.

123. (New) The optoelectronic system of Claim 120, wherein the active region is doped with erbium ions and ytterbium ions.

124. (New) A multi-dimensional optoelectronic device, comprising:

a substrate having a first surface;

a first optical interconnect formed on the first surface of the substrate in a first horizontal plane of orientation relative to the first surface, the first optical interconnect comprising a sol-gel based material and an active region; and

a second optical interconnect formed in a second horizontal plane of orientation relative to the first surface, the second optical interconnect comprising a sol-gel based material and an active region.

125. (New) The multi-dimensional optoelectronic device of Claim 124, further comprising a third optical interconnect formed in a third horizontal plane of orientation relative to the first surface, the third optical interconnect comprising a sol-gel based material and an active region.

126. (New) The multi dimensional optoelectronic device of Claim 124, further comprising a third optical interconnect formed on the first surface of the substrate generally parallel to and disposed coplanar with the first optical interconnect, the

second optical interconnect comprising a sol-gel based material and an active region and a fourth optical interconnect formed in the same plane of orientation as the second optical interconnect generally parallel to the second optical interconnect, the fourth optical interconnect comprising a sol-gel based material and an active region.

127. (New) The multi-dimensional optoelectronic device of Claim 126, further comprising a first coupling region comprising an area in which the first, second, third and fourth optical interconnects come into close proximity to one another so as to facilitate optical coupling.

128. (New) The multi-dimensional optoelectronic device of Claim 126, wherein the first, second, third and fourth optical interconnects are geometrically symmetric.

129. (New) The multi-dimensional optoelectronic device of Claim 126, wherein the first, second, third and fourth optical interconnects are geometrically asymmetric.

130. (New) The multi-dimensional optoelectronic device of Claim 124, further comprising third and fourth optical interconnects formed in the second horizontal plane of orientation, wherein the second, third and fourth optical interconnects are generally parallel to each other and comprise a sol-gel based material and an active region and a fifth optical interconnect formed in a third horizontal plane of orientation relative to the first surface and displaced from the second plane of orientation, the fifth optical interconnect comprising a sol-gel based material and an active region.

131. (New) The multi-dimensional optoelectronic device of Claim 130 wherein the first, third and fifth optical interconnects are formed in a first vertical plane of orientation relative to the first surface and the second and fourth optical interconnects are disposed in the second horizontal plane of orientation generally equidistant from opposite sides of the third optical interconnect.

132. (New) The multi-dimensional optoelectronic device of Claim 130, wherein the first, second, third, fourth and fifth optical interconnects are positioned in close proximity to one another to define a first coupling region which facilitates optical coupling between the first, second, third, fourth and fifth optical interconnects.